

1 WHAT IS CLAIMED IS:

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3 1. A semiconductor current detector of improved noise immuni-
4 ty for detecting or measuring an electric current, comprising:

5 (a) a semiconductor substrate having a Hall-effect device formed
6 therein from one surface thereof, the Hall-effect device
7 having a plurality of semiconductor regions including a pri-
8 mary working region for generating a Hall voltage propor-
9 tional to the magnitude of a current to be detected or
10 measured;

11 (b) insulating means formed on said one surface of the semiconduc-
12 tor substrate;

13 (c) a shielding layer formed in the insulating means for shielding the
14 Hall-effect device from external disturbances; and

15 (d) a conductor strip formed in the insulating means so as to extend
16 around at least part of the primary working region of the
17 Hall-effect device, for carrying at least a prescribed frac-
18 tion of the current to be translated into the Hall voltage
19 by the Hall-effect device.

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21 2. The semiconductor current detector of claim 1 wherein the
22 conductor strip surrounds at least about three quarters of the primary
23 working region of the Hall-effect device.

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25 3. A semiconductor current detector of improved noise immuni-
26 ty for detecting or measuring an electric current, comprising:

27 (a) a semiconductor substrate having a Hall-effect device formed
28 therein from one surface thereof, the Hall-effect device
29 having a plurality of semiconductor regions including a pri-
30 mary working region for generating a voltage proportional
31 to the magnitude of a current to be detected or measured;

32 (b) a first insulating layer formed on said one surface of the semi-
33 conductor substrate so as to cover the Hall-effect device;

34 (c) a plurality of electrodes formed on the first insulating layer and
35 electrically connected respectively to some of the semicon-
36 ductor regions of the Hall-effect device through windows in

- 1 the first insulating layer;
- 2 (d) a plurality of conductor strips formed on the first insulating layer
3 and electrically connected respectively to the electrodes;
- 4 (e) a second insulating layer formed on the first insulating layer and
5 covering the electrodes and the conductor strips;
- 6 (f) a shielding layer formed on part of the second insulating layer so
7 as to cover at least part of the primary working region of
8 the Hall-effect device;
- 9 (g) a third insulating layer formed on the second insulating layer and
10 covering the shielding layer; and
- 11 (h) a conductor strip formed on the third insulating layer so as to
12 extend around at least part of the primary working region
13 of the Hall-effect device, for carrying at least a prescribed
14 fraction of the current to be detected or measured.

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16 4. The semiconductor current detector of claim 3 further com-
17 prising:

- 18 (a) a fourth insulating layer formed on the third insulating layer and
19 covering the conductor strip; and
- 20 (b) a second shielding layer formed on the fourth insulating layer so
21 as to cover at least part of the primary working region of
22 the Hall-effect device.

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24 5. The semiconductor current detector of claim 3 further com-
25 prising a magnetic collector formed on the third insulating layer.

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27 6. A semiconductor current detector of improved noise immuni-
28 ty for detecting or measuring an electric current, comprising:

- 29 (a) a semiconductor substrate having a Hall-effect device formed
30 therein from one surface thereof, the Hall-effect device
31 having a plurality of semiconductor regions including a pri-
32 mary working region for generating a voltage proportional
33 to the magnitude of a current to be detected or measured;
- 34 (b) a first insulating layer formed on said one surface of the semi-
35 conductor substrate so as to cover the Hall-effect device;
- 36 (c) a plurality of electrodes formed on the first insulating layer and

- 1 electrically connected respectively to some of the semicon-
2 ductor regions of the Hall-effect device through windows in
3 the first insulating layer;
- 4 (d) a plurality of conductor strips formed on the first insulating layer
5 and electrically connected respectively to the electrodes;
- 6 (e) a second insulating layer formed on the first insulating layer and
7 covering the electrodes and the conductor strips;
- 8 (f) a conductor strip formed on the second insulating layer so as to
9 extend around at least part of the primary working region
10 of the Hall-effect device, for carrying at least a prescribed
11 fraction of the current to be detected or measured;
- 12 (g) a third insulating layer formed on the second insulating layer and
13 covering the conductor strip; and
- 14 (h) a shielding layer formed on the third insulating layer so as to
15 cover at least part of the primary working part of the
16 Hall-effect device.

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18 7. The semiconductor current detector of claim 6 further com-
19 prising a magnetic collector formed on the shielding layer .
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